

AEROLOGICAL OBSERVATIONS

[Aerological Division, W. R. Gregg, in charge]

By L. T. SAMUELS

Free-air temperatures during November were practically normal in the lower levels and above normal in the upper levels at the midwestern and western stations, and mostly below normal at the eastern and southern stations. (Table 1.) The mean temperature for the month at San Diego is of special interest in that a marked inversion occurred from the surface to 1,000 meters, whereas the normal lapse rate for November at this station is positive. In this connection it is noted that a greater northerly wind component than usual obtained at the surface at this station during the month, which probably was a factor in causing the temperature to be below normal; also, the usual prevailing northeast wind at 500 and 1,000 meters was replaced by an east and east-southeast wind, respectively, which likewise probably was a factor in causing the mean temperatures at those levels to be above normal.

Free-air relative humidities averaged mostly above normal except at Omaha and Washington, where negative departures occurred.

Resultant wind directions in the lower levels were close to normal except in the southeastern section of the country, where a pronounced northerly component prevailed as compared to the normal westerly. (Table 2.) Resultant velocities at these levels were below normal at most stations.

At the higher levels resultant directions were close to normal with resultant velocities considerably below normal at most stations, except in the northwestern States where velocities were generally in excess of normal.

Five airplane observations were made during November at Fairbanks, Alaska, as part of the International Polar Year program. In connection with the latter a total of 91 sounding-balloons were released at Dallas, Ellendale, and Omaha between August and December, 1932, inclusive. From 57 (63 per cent) of these balloons the instruments already (December 29, 1932) have been returned.

TABLE 1.—Free-air temperatures and relative humidities during November, 1932

TEMPERATURE (° C.)

Altitude (meters) m. s. l.	Atlanta, Ga. (303 meters) ¹		Boston, Mass. (4 meters) ²		Chicago, Ill. (187 meters) ³		Cleveland, Ohio (246 meters) ³		Dallas, Tex. (146 meters) ⁴		Ellendale, N. Dak. (444 meters)		Omaha, Nebr. (300 meters) ⁵		Pensacola, Fla. (2 meters) ⁶		San Diego, Calif. (9 meters) ⁶		Washington, D. C. (2 meters) ⁶	
	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal
Surface.....	6.3	(?)	4.0	-----	-0.3	(?)	1.8	(?)	5.5	(?)	-2.4	-0.1	-1.8	(?)	11.4	-2.2	15.3	-2.6	1.3	-4.3
500.....	6.7	(?)	2.5	-----	0	(?)	2.0	(?)	9.3	(?)	-2.5	-2	-4	(?)	11.7	-1.6	17.9	+1.0	2.5	-3.0
1,000.....	6.9	-1.5	1.7	-----	-2	-1.6	.3	-1.1	9.3	-5	-1.0	+9	2.2	-8	11.1	-9	18.5	+2.2	2.5	-1.8
1,500.....	6.5	-2	1.0	-----	-5	-6	-1.4	-1.5	8.3	0	-7	+1.5	2.3	+1	-----	-----	-----	-----	-----	-----
2,000.....	5.3	+3	.3	-----	-1.3	+4	-2.2	-5	6.4	-1	-2.1	+1.7	1.2	+8	8.5	-9	-----	-----	-----	-----
2,500.....	3.7	+5	-1.6	-----	-3.0	+6	-3.9	-3	4.4	0	-4.7	+1.3	-5	+1.4	-----	-----	14.7	+3.2	1.1	-2
3,000.....	1.1	0	-3.9	-----	-5.4	+5	-5.7	+2	2.6	+6	-7.7	+9	-2.6	+1.9	3.8	-1.5	10.1	+3.9	-----	-----
4,000.....	-4.9	-5	-8.7	-----	-10.7	+1	-10.7	+1	-2.5	+8	-14.2	+1	-8.8	+1.2	-2.0	-1.5	4.2	+3.9	-1.4	+3
5,000.....	-12.2	-2.0	-15.1	-----	-16.6	+2	-18.2	-1.4	-8.4	+8	-----	-----	-15.3	+3	-----	-----	-3.0	+3.9	-----	-----

RELATIVE HUMIDITY (PER CENT)

Surface.....	84	(?)	69	-----	80	(?)	78	(?)	74	(?)	75	-3	76	(?)	84	+2	75	+17	77	+3
500.....	82	(?)	65	-----	75	(?)	75	(?)	62	(?)	74	-2	68	(?)	79	+4	59	+9	65	0
1,000.....	74	+12	64	-----	67	-1	72	+4	53	-6	65	0	55	-3	72	+4	46	+7	57	-3
1,500.....	66	+8	59	-----	61	+2	66	+7	49	-3	59	+1	47	-6	-----	-----	-----	-----	-----	-----
2,000.....	60	+7	53	-----	56	+3	57	+4	45	-2	61	+6	45	-5	59	+4	34	+5	44	-9
2,500.....	53	+8	51	-----	52	+3	56	+7	43	+1	63	+9	44	-5	-----	-----	-----	-----	-----	-----
3,000.....	52	+11	50	-----	50	+2	55	-7	40	+2	65	+11	42	-8	52	+8	29	+4	32	-6
4,000.....	45	+10	47	-----	47	+3	52	+8	37	+3	48	-8	44	-7	52	+8	26	+4	-----	-----
5,000.....	45	+22	45	-----	47	+1	54	+8	36	+4	-----	-----	44	-3	-----	-----	25	+4	-----	-----

¹ Temperature and humidity departures based on normals of Due West, S. C.

² Observations made by Massachusetts Institute of Technology.

³ Temperature and humidity departures based on normals of Royal Center, Ind.

⁴ Temperature departures based on normals determined by interpolating between those of Groesbeck, Tex., and Broken Arrow, Okla. Humidity departures based on normals of Groesbeck, Tex.

⁵ Temperature and humidity departures based on normals of Drexel, Nebr.

⁶ Naval air stations.

⁷ Surface and 500-meter departures omitted because of difference in time between airplane observations and those of kites upon which the normals are based.

Weather Bureau airplane observations made near 5 a. m.; Navy airplane observations near 7 a. m.; Ellendale kite observations near 9 a. m. (seventy-fifth meridian time).

TABLE 2.—Free-air resultant winds (meters per second) based on pilot balloon observations made near 7 a. m. (E. S. T.) during November, 1932

[Wind from N=360°; E=90°, etc.]

Altitude (meters) m. s. l.	Albuquerque, N. Mex. (1,528 meters)		Atlanta, Ga. (309 meters)		Bismarck, N. Dak. (518 meters)		Brownsville, Tex. (12 meters)		Burlington, Vt. (132 meters)		Cheyenne, Wyo. (1,873 meters)		Chicago, Ill. (192 meters)		Cleveland, Ohio (245 meters)		Dallas, Tex. (154 meters)		Havre, Mont. (762 meters)		Jacksonville, Fla. (14 meters)		Key West, Fla. (11 meters)	
	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity
Surface.....	23	1.1	22	1.5	293	1.0	332	1.5	185	2.1	277	4.8	284	0.9	206	1.9	216	0.5	244	2.0	350	2.4	30	2.8
500.....			39	2.6			65	1.8	222	3.3			230	4.3	217	4.2	213	2.7			21	5.0	44	5.9
1,000.....			32	2.0	280	6.6	144	.7	265	4.7			244	4.8	244	5.3	269	3.5	252	6.5	335	2.4	51	2.7
1,500.....			301	2.7	281	8.3	314	1.4	277	8.3			254	5.9	250	6.1	292	4.0	270	10.1	299	4.0	71	1.3
2,000.....	321	2.0	306	6.8	282	9.3	336	4.4	284	10.2	280	7.9	273	5.4	252	6.5	303	5.1	281	11.2	312	5.1	315	1.6
2,500.....	301	4.1	310	9.6	288	9.7	310	4.1	296	10.3	289	14.9	276	6.5	258	7.7	304	5.1	280	13.0	302	6.7	297	1.1
3,000.....	302	6.6	333	7.3	276	12.2	302	4.8	288	11.2	298	12.6	284	6.8	267	9.5	303	5.7	286	13.9	272	9.0	349	.3
4,000.....	301	9.8	318	8.6			307	4.0	322	8.1	304	12.7					293	7.6					295	2.6
5,000.....	297	9.2					315	4.8			281	6.5					310	6.0					276	6.2

Altitude (meters) m. s. l.	Los Angeles, Calif. (217 meters)		Medford, Oreg. (410 meters)		Memphis, Tenn. (83 meters)		New Orleans, La. (25 meters)		Oakland, Calif. (8 meters)		Oklahoma City, Okla. (402 meters)		Omaha, Nebr. (306 meters)		Phoenix, Ariz. (356 meters)		Salt Lake City, Utah (1,294 meters)		Sault Ste. Marie, Mich. (198 meters)		Seattle, Wash. (14 meters)		Washington, D. C. (10 meters)	
	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity
Surface.....	35	0.4	170	0.5	56	0.6	44	1.6	126	1.2	351	0.5	190	8.5	101	1.7	146	2.4	134	0.7	158	1.9	323	2.5
500.....	30	.4	153	1.1	250	1.2	61	3.2	51	1.6	208	1.0	222	3.7	88	3.2			236	3.1	190	8.3	321	4.7
1,000.....	50	1.3	156	3.5	255	3.4	25	2.3	47	1.3	287	3.4	258	5.6	77	3.0			253	5.7	206	10.1	327	3.8
1,500.....	24	.8	200	5.8	287	5.1	340	2.2	296	.4	298	3.5	265	6.7	74	1.9	171	3.3	261	7.0	217	9.6	296	3.6
2,000.....	282	1.2	222	8.0	303	6.2	345	4.0	276	.6	300	4.2	272	7.5	27	.8	210	3.6	248	8.3	213	9.4	284	4.6
2,500.....	283	2.1	242	10.6	306	9.2	342	5.0	244	2.5	307	5.8	276	8.0	288	1.9	259	3.9			219	11.0	290	5.4
3,000.....	296	3.3	260	12.1	306	9.9	313	3.2	307	2.1	309	6.6	288	9.2	296	2.9	276	6.4					275	5.5
4,000.....	280	3.3	290	12.4							285	7.6	293	14.0	299	6.4	285	8.8						
5,000.....													302	13.7	300	8.2								

RIVERS AND FLOODS

By RICHMOND T. ZOCH

[River and Flood Division, Montrose W. Hayes in charge]

In November, 1932, floods occurred only in the Atlantic slope and east Gulf of Mexico States. None of them was important. The loss amounting to \$3,200, was confined to matured crops in Alabama and was caused by the Tombigbee River.

The following tables show the river-gage stations at which flood stage was reached and the value of property saved through flood warnings:

Table of flood stages in November, 1932

[All dates are in November unless otherwise indicated]

River and station	Flood stage	Above flood stages—dates		Crest		
		From—	To—	Stage	Date	
ATLANTIC SLOPE DRAINAGE						
	<i>Feet</i>			<i>Feet</i>		
Farmington: Collinsville, Conn.-----	5	19	19	6.6	19	
Connecticut: Hartford, Conn.-----	16	20	22	18.0	20	
Susquehanna: Oneonta, N. Y.-----	12	20	20	13.2	20	
Roanoke: Williamston, N. C.-----	9	7	17	10.5	15-16	
Peedee: Mars Bluff Bridge, S. C.-----	17	5	10	17.8	7	
Saluda:						
Pelzer, S. C.-----	6	Oct.	2	9.2	1	
Chappells, S. C.-----	12		4	15.3	3	
Broad: Blairs, S. C.-----	14	1	2	17.3	2	
Santee:						
Rimi, S. C.-----	12	{	3	17	15.5	
			22	24	12.2	24
			27	30	13.5	30
Ferguson, S. C.-----	12	{	2	30	13.6	
Jamestown, S. C.-----	12		1	19	13.5	15-16
			3	8	18.8	8
Savannah: Ellenton, S. C.-----	14	{	23	24	15.2	
			28	30	15.8	28

Table of flood stages in November, 1932—Continued

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
EAST GULF OF MEXICO DRAINAGE					
	<i>Feet</i>			<i>Feet</i>	
Choctawhatchee: Caryville, Fla.....	10	3	6	11.1	4
Black Warrior: Tuscaloosa, Ala.....	46	27	27	48.0	27
Tombigbee:					
Demopolis, Ala.....	39	{ Oct. 17	5	56.6	Oct. 26
		29	Dec. 3	41.8	Dec. 1
		{ Oct. 17	10	56.8	Oct. 27-28
Lock No. 3, Ala.....	33	{ 27	(1)	43.6	Dec. 2
Lock No. 2, Ala.....	46	{ Oct. 18	6	57.5	Oct. 29
Lock No. 1, Ala.....	31	{ Oct. 18	11	38.6	1-2
Pearl: Jackson, Miss.....	18	{ 11	15	19.1	14

1 Continued into December.

VALUE OF PROPERTY SAVED BY WARNINGS

ATLANTIC SLOPE DRAINAGE	
Connecticut River in Connecticut.....	\$40,000
Saluda River in South Carolina.....	500
Broad River in South Carolina.....	700
Congaree River in South Carolina.....	3,000
Catawba-Wateree River in South Carolina.....	7,500
Santee River in South Carolina.....	4,000
EAST GULF OF MEXICO DRAINAGE	
Tombigbee River in Alabama.....	20,000